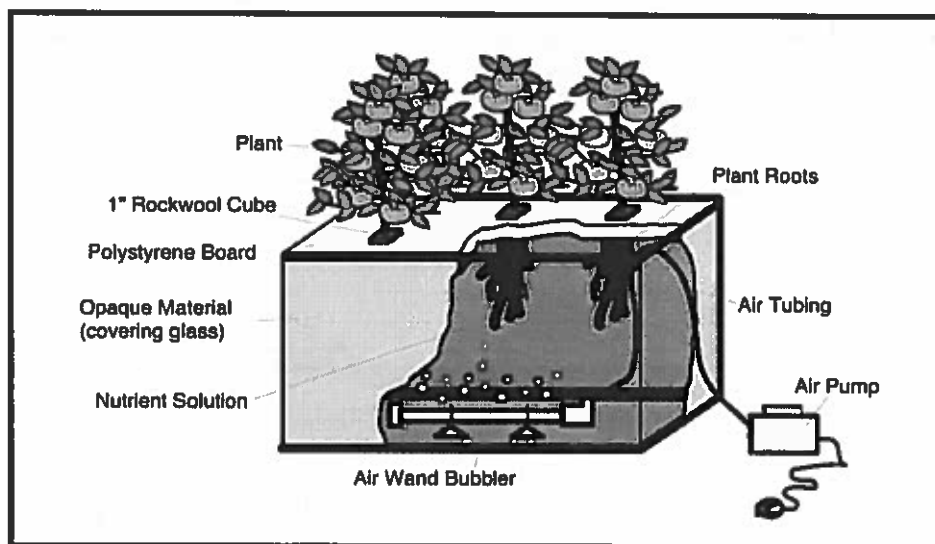


THE LAND



HYDROPONIC GRO-TANK

The Land at Epcot® demonstrates a variety of hydroponic growing methods. Hydroponics – growing plants without soil – is the method used to grow over 60 different types of plants in The Land greenhouses. If you would like to try growing plants hydroponically, The Land Gro-Tank, pictured below, is a simple hydroponic system for students, teachers, and beginning hydroponic hobbyists. It utilizes a 10-gallon aquarium, an air supply, polystyrene board, and plants. If maintained properly, it can provide you with delicious fresh herbs and vegetables and hours of fun growing your own food. Assembly instructions for the Gro-Tank are on the reverse side of this page.



Starting Your Plants

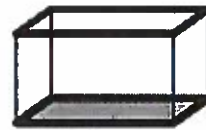
Seedlings should be seeded prior to filling your tank. Read the back of your seed package carefully; it will give you the germination (sprouting) time for whatever variety of vegetable or herb you decide to grow. Using your rockwool or oasis cubes (*available from a hydroponic supplier*), place one (1) seed in each cube and keep the cube moist until the seed has germinated. After the seeds germinate, they can be watered with a half-strength nutrient solution. Be sure to have a small seedling that has developed a few good roots before transferring it to your hydroponic tank.

THE LAND HYDROPONIC GRO-TANK

Steps for Assembly and Operation

1. Set the **aquarium** in a south window to allow the plants to receive full light, or for best results, use an artificial grow light. Cover the sides of the aquarium with dark **opaque material** to prevent light from entering the sides. This will prevent algae growth in the nutrient solution.
2. Place **air pump** outside the aquarium and the **air wand bubbler** on the bottom of the tank. Run the air tubing from the air pump to the wand.
3. Fill the tank with clean water and add the **hydroponic nutrients** (available from a hydroponic supplier). Remember to follow the instructions on the label when mixing the nutrients with water. Once the nutrient solution is in the tank, be sure to turn on the air pump and adjust air flow for a soft gentle flow of bubbles in your tank.
4. Once the nutrient solution has been thoroughly mixed it must be adjusted to a proper pH (*pH test kits and adjusters available from a hydroponic supplier*). Using the litmus paper, test your nutrient solution. Nutrient adjustments can be made by using a **pH up (base)** or **pH down (acid)**. Your target pH should be 5.5. A safe pH range is 5.5 - 6.5.
5. Cut the **polystyrene board** so it floats on the nutrient solution and fits tightly into the tank. Cut 1" square holes in the board, 6 - 7 inches apart. This will allow for about six plants in your hydroponic tank.
6. Insert the **rockwool or oasis cubes** containing small seedlings into the holes in the polystyrene board. Be sure that the cube extends slightly below the board so it can absorb the nutrient solution.
7. To maintain your system, check and adjust the pH of your nutrient solution each week. If the nutrient solution level in the tank has lowered, you can add a half-strength nutrient solution to bring it back up to volume.
8. After your crop has completed its life cycle, be sure to drain and thoroughly clean the tank before you start a new crop of vegetables or herbs. **Good Luck!**

Materials Needed



10-Gallon Aquarium



Opaque Material
(Construction paper, cardboard, etc.)



Air Pump, Air Tubing, Air Wand Bubbler
(Standard aquarium equipment)

N - Nitrogen

P - Phosphorus

K - Potassium



Mix A
15-0-0
N-P-K

Mix B
5-10-25
N-P-K

w/o ammonia

Hydroponic Nutrients
(Available from a hydroponic supplier)



Litmus Paper & pH Adjusters
(Standard aquarium equipment)



Polystyrene Board
(Foam board - 1" thick - available from hobby and hardware stores)



1" Rockwool or Oasis Grow Cubes
(Available from a hydroponic supplier)



Seeds
(Lettuce, tomato, herbs, etc.)

HYDROPONIC RESOURCES

Verti-Gro, Inc.
1-800-955-6757
www.vertigro.com

Crop King Inc.
1-800-321-5656
www.cropking.com

Gro | Dan
www.hydroponics101.com

BioWorks, Inc.
1-800-877-9443
www.bioworksinc.com

Howard Dill Enterprises
1-902-798-2728
www.howarddill.com

Utah State University Crop
Physiology Laboratory
www.usu.edu/cpl

Aquaculture Network Information Center
<http://aquanic.org>

University of Florida - Horticultural Sciences Department
<http://www.hos.ufl.edu/ProtectedAg>